Sydney Post-traumatic Amnesia Scale (SYPTAS)

Administration and technical manual

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The Sydney Post-traumatic Amnesia scale (SYPTAS) is a brief standardised instrument for bedside assessment of post-traumatic amnesia (PTA) during an acute stage of recovery from a traumatic brain injury (TBI) in children aged 4 years 0 months to 7 years 11 months. The SYPTAS was developed to address an identified area of clinical need: the lack of a single instrument that has adequate validity for assessment of PTA in young children. The scale has good developmental, concurrent and predictive validity. The SYPTAS is a result of collaboration between the Brain Injury Rehabilitation Team at Sydney Children's Hospital Randwick and the School of Psychology, University of Sydney.

This manual is divided into two sections. The first section (introduction) of the manual provides general information about PTA and main findings of the SYPTAS validation studies. The second part of this manual provides implementation guidelines.

General introduction

What is Post-traumatic Amnesia (PTA)?

PTA is a period following TBI during which a patient is '… confused, amnesic for ongoing events and likely to evidence behavioural disturbance' (p 675) (Levin, O'Donnell, & Grossman, 1979). During PTA patients are awake, but they may be disoriented for (i) person (i.e., not know who they are, unable to recognise family members), (ii) place (confused about where they are) and (iii) time (confused about time of the day and date). In addition, patients are amnesic for ongoing events; they have difficulties remembering what happened on previous days, a few hours or only minutes ago. Significant behavioural changes may also be present. Duration of PTA is typically defined as the number of hours, days, weeks or even months a patient takes, from the time of the injury, to regain orientation and reliably retain new information (Fortuny, Briggs, Newcombe, Ratcliff, & Thomas, 1980).

Why assess PTA?

Assessment of PTA following TBI is undertaken for several main clinical reasons.

- First, assessment of PTA is used to *monitor early cognitive recovery*, as PTA resolves gradually (Briggs et al., 2016; Geffen, Encel, & Forrester, 1991; Gronwall & Wrightson, 1980; High, Levin, & Gary, 1990; Leach, Kinsella, Jackson, & Matyas, 2006; McFarland, Jackson, & Geffen, 2001; Saneda & Corrigan, 1992; Tate, Pfaff, & Jurjevic, 2000).
- Second, assessment of PTA *guides allocation of rehabilitation resources and selection of management strategies, and discharge planning* (Briggs, Brookes, Tate, & Lah, 2015). While in PTA, patients can be challenging to manage and can require additional supervision and resources due to cognitive and behavioural disturbances such as

agitation, confusion, reduced judgement and sense of danger, which increases the risk of falls or absconding (Snow & Ponsford, 2013).

- Third, duration of PTA, alongside depth of coma, is the most commonly used *indicator of TBI severity*. Accurate assessment of injury severity is important, as greater TBI severity is associated with poorer physical, cognitive, behavioural and social outcomes, lower adaptive functioning and quality of life (Anderson, Godfrey, Rosenfeld, & Catroppa, 2012; Babikian & Asarnow, 2009; Fay et al., 2009; Taylor et al., 2008), although outcome is also influenced by psychosocial risk and protective factors (Gerring & Wade, 2012).
- Fourth, PTA has repeatedly (but not always) been found to be a better *predictor of long-term cognitive and functional outcomes* than other indicators of injury severity, such as coma scores in adults (Ariza et al., 2004; Brown et al., 2005; Sherer, Struchen, Yablon, Wang, & Nick, 2008) and school aged children (see Briggs et al., 2015, for a review).

How is PTA assessed?

Historically, PTA assessments involved clinical interviews. Assessments were conducted when patients were no longer in PTA. The aim of these retrospective interviews was to determine when a patient "came to himself" (Russell, 1932). That is, to establish when confusion and disorientation had cleared. These retrospective interviews were seen as subjective and unreliable (see Forrester, Encel, & Geffen, 1994 for a historic review). Subsequently, several standardised instruments were developed for prospective assessment of PTA.

Currently, PTA is assessed in routine clinical practice by daily administration of a standardised PTA scale, which includes orientation and memory items. The administration of such a scale usually begins when a patient emerges from coma and ceases when the patient becomes oriented and re-gains continuous memory. Typically, the length of PTA is considered to be the number of days from the day of injury (including coma) to the day when a criterion for resolution of PTA is met for two (Ewing-Cobbs, Levin, Fletcher, Miner, & Eisenberg, 1990; Levin et al., 1979; Tate, Perdices, Pfaff, & Jurjevic, 2001) or three (Shores, Marosszeky, Sandanam, & Batchelor, 1986) consecutive days.

Instruments developed to assess PTA and subsequent research that used these instruments have mainly involved adults. Adult findings are unlikely to be directly applicable to children, as children and adults with TBI differ with respect to neuropathology, cognitive development and outcomes. In children, diffuse brain injuries (Taylor & Alden, 1997) and intracranial hypertension (Segal, Gallagher, Shefler, Crawford, & Richards, 2001) are more common post TBI than in adults. Moreover, in children many skills are still developing. As such, TBI not only disrupts already established skills, as in adults, but can also derail development of currently maturing and later emerging skills in children (Anderson, Brown, Newitt, & Hoile, 2011; Anderson & Moore, 1995). This double impact of TBI carries a risk of poor long-term outcomes in children, especially in children who sustain injuries at an early age (Anderson, Catroppa, Morse, Haritou, & Rosenfeld, 2009; Anderson & Moore, 1995; Benz, Ritz, & Kiesow, 1999; Jaffe et al., 1993; McKinlay, Dalrymple-Alford, Horwood, & Fergusson, 2002).

PTA scales that have been adapted or specifically developed for use with children include: the Westmead Post-Traumatic Amnesia Scale (WPTAS; Marosszeky et al., 1993; Shores et

al., 1986), the Children's Orientation and Amnesia Test (COAT; Ewing-Cobbs et al., 1990), an adaptation of the Oxford PTA Scale for use with children (termed Oxford C in the current manual; Ruijs, Keyser, & Gabreels, 1992), the Starship Posttraumatic Amnesia Scale (Starship PTA; Fernando, Eaton, Faulkner, Moodley, & Setchell, 2002), and the Westmead Post-Traumatic Amnesia Scale for Children (WPTAS-C; Rocca, Wallen, & Batchelor, 2008). All scales contain items assessing orientation and memory. Nevertheless, the scales differ with respect to the items included in the scale and criteria used to determine whether a child is in PTA. The number of items that measure orientation and memory range from 2 to 11, and 4 to 13, respectively. Criteria used to determine whether a child is out of PTA includes (i) passing all items/obtaining a perfect score (WPTAS, Oxford-C; WPTAS-C) or (ii) obtaining a score that falls within the range deemed developmentally appropriate (COAT, Starship PTA).

Why develop a new scale for assessment of PTA in young children?

While PTA scales currently used with paediatric populations are appropriate for school aged children who have sustained TBI, significant limitations have been identified in the use of these scales with children under 8 years of age. The main limitations in using the current PTA scales with children under 8 are:

1. Classifying children as being in PTA when they are not: *false positive*.

Young children may fail items included in a PTA scale due to immaturity rather than due to being in PTA. Specifically, while ≥90% of non-head injured children aged ≥8 years achieved perfect scores on consecutive days of testing, therefore meeting the criterion of the WPTAS, only 15 % of 6- and 7-year-old non-head injured children met this criterion (Marosszeky et al., 1993). Hence, 85% of these 6- and 7-year-old non-head injured children

would have been classified as being in PTA when they were not. Thus, the authors recommended that the WPTAS only be used with children 8 years old and older. Similarly, the Oxford-C (Ruijs et al., 1992), contains several questions that are developmentally inappropriate, and thus unlikely to be passed by children under 7 years of age. For example, the question "When is your birthday" is likely to be failed by children under 7-years of age (Marosszeky et al., 1993). Moreover, the question 'Which grade you are in?' will be failed by children who do not attend school, which is the case for many 4- and 5-year-old children in Australia. Surprisingly, children aged 3.5 to 5 years were reported to pass all items of the scale (Ruijs et al., 1992), which seems highly unlikely. It is possible, that a modified version of the scale was administered to these younger children, but this was not reported in the manuscript.

2. Classifying children as being out of PTA when they are in PTA: *false negative*. Children may be deemed out of PTA while they are not fully oriented or do not reliably retain new information. For example, the COAT requires an overall (memory and orientation score) to fall within two standard deviations of the mean for the child's age to be considered out of PTA. The COAT contains only one item that assesses memory for ongoing events (a cardinal feature of PTA), which does not have to be answered correctly for a child to be considered out of PTA. The Starship PTA scale also uses developmental norms to assess whether a child is in PTA; a child is deemed out of PTA when an overall score on this scale falls within one standard deviation from the age mean. The scale includes several orientation and memory items, which reduces the likelihood that a child can pass the scale without having answered any memory items correctly. Nevertheless, using developmental norms is problematic, as children could provide correct responses to

different items from one day to another and obtain a score that falls within the normative range, while still confused and in PTA.

3. Lack of clinical validation studies.

It is unclear whether the length of PTA as measured by existing scales relates to other TBI indicators (concurrent validity) or predicts outcomes (predictive validity) for the younger children. For example, PTA duration measured by the Oxford-C was related to (i) neurological problems and personality changes at discharge, and (ii) neurological problems, personality changes and school problems at 3, 6, 12 and 24 months post-injury (Ruijs et al., 1992) in a group of children aged 2 to 15 years. It is unclear, however, whether the full scale was administered and passed by children as young as 2 years in this validation study. Furthermore, concurrent validity of the Oxford-C has not been reported in any of the studies that used this scale. The WPTAS-C (Rocca et al., 2008), which was validated on 4- and 5- year old children has not been used with a clinical population.

In summary, the review of the scales for assessment of PTA revealed several shortcomings when used with children under 8 years of age. Thus, we decided to develop a new scale for children aged 4 to 7 years.

Sydney Post-traumatic Amnesia Scale (SYPTAS)

The lack of a reliable instrument for assessment of PTA in young children was identified as a major shortcoming for clinical work by members of the Sydney Children's Hospital Brain Injury Rehabilitation team. In developing a new scale, we reviewed the developmental literature, which indicated that memory for ongoing events is underdeveloped in children under 4 years of age and is unlikely to be accurately assessed using currently developed assessment procedures in clinical practice (childhood amnesia; see Hayne & Jack, 2011 for a review). Therefore, the scale was not intended for use with children under 4 years of age.

Selection of items to be included in the scale was based on review of the literature (including, but not limited to the scales reviewed above), clinical expertise of the team members, and team discussions. Ten items were initially selected to be used for assessment of PTA in children aged 4- to 7- years: 5 orientation items (3 orientation to person, 1 orientation to time and 1 orientation to place) and 5 memory items (2 for face and name of an examiner, 3 for pictured objects). Two validation studies were conducted. One study examined validity of the selected items when used with non-brain injured, typically developing children. Another study examined validity of the items in the clinical population: children who had sustained TBI. Both studies were approved and conducted in accordance with ethics permissions obtained from Human Ethics Committees of the Sydney Children's Hospital (Randwick) and The University of Sydney. These studies were conducted by Dr Pamela David and comprised a research component of her Doctor of Clinical Psychology/Master of Science degree.

Validation study one: typically developing children

The aim of the initial validation study was to identify orientation and memory items that were developmentally appropriate (for details see Lah et al., 2018). The criterion used for an item to be deemed developmentally appropriate was that the item was answered correctly on each and every day of testing by ≥ 90 % (as per criteria used by Marosszeky et al., 1993) of children aged 4 to 7 years.

Fifty-two typically developing children (26 male) aged 4 to 7 years participated in the study. The sample was recruited from pre-schools, childcare centres, through researchers' social networks in Sydney, by placing advertisements in the centre's newsletters and distributing information sheets to parents. Only children who were within the above specified age range, were fluent in English and free of major developmental/neurological disorders (e.g. intellectual disability, autism, cerebral palsy, epilepsy, brain tumour, traumatic brain injury) were included in the study. Ten items (5 orientation, 5 memory) were administered over 3-4 days.

The number (percentage) of correct answers provided by children of different ages were examined for each and every orientation and memory item. Three orientation and two memory items that were answered with > 90% accuracy on each and every day of testing in each age-group were:

1. How old are you?
2. What is your mother's/father's name?
3. What is the name of this place?
4. Which photo did you have to remember?
5. What was her name?

These items were deemed developmentally appropriate (see Table 1) and selected to be included in the final version of the scale that was validated on the clinical sample.

A pass rate of 96.2% was obtained when the scores of the 5-item scale were examined. Fifty of the 52 children answered all questions correctly on each day of testing. Only two of 52 children failed the scale on one day of testing. They were both 4-year-olds and they both scored 4/5 on one day of testing only. While one child answered one orientation item incorrectly, "How old are you?", on the first day of assessment, another child answered one memory item incorrectly, "What was her name?", on the second day of testing. Both children obtained maximal scores on each and every other day of testing.

In summary, this first validation study identified 5 (3 orientation, 2 memory) items that had excellent developmental validity and test-retest reliability in children aged 4 to 7 years. These 5 items were included in the Sydney PTA scale (SYPTAS) that was further validated in a clinical sample.

Table 1

Frequency (Percentage) of correct responses to each orientation item, stratified by age group and day of testing

Question	Day 1	Day 2	Day 3	Total (3 Days)	Day 4	Total (4 Days)
Age Group	C/T (%)	C/T (%)	C/T (%)	C/T (%)	C/T (%)	C/T (%)
1. *How old are you?*						
4 years	18/19 (95)	19/19 (100)	19/19 (100)	56/57 (98)	14/14 (100)	70/71 (99)
5 years	13/13 (100)	13/13 (100)	13/13 (100)	39/39 (100)	10/10 (100)	49/49 (100)
6 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	8/8 (100)	38/38 (100)
7 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	9/9 (100)	39/39 (100)
Total	51/52 (98)	52/52 (100)	52/52 (100)	155/156 (99)	42/42 (100)	197/198 (99)
2. *Where do you live?*						
4 years	8/19 (42)	8/19 (42)	8/19 (42)	24/57 (42)	7/14 (50)	31/71 (44)
5 years	12/13 (92)	12/13 (92)	12/13 (92)	36/39 (92)	10/10 (100)	46/49 (94)
6 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	8/8 (100)	38/38 (100)
7 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	9/9 (100)	39/39 (100)
Total	40/52 (77)	40/52 (77)	40/52 (77)	120/156 (77)	34/41 (83)	154/197 (78)
3. *What is your mother's/ father's name?*						
4 years	19/19 (100)	19/19 (100)	19/19 (100)	57/57 (100)	14/14 (100)	71/71 (100)
5 years	13/13 (100)	13/13 (100)	13/13 (100)	39/39 (100)	10/10 (100)	49/49 (100)
6 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	8/8 (100)	38/38 (100)
7 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	9/9 (100)	39/39 (100)
Total	52/52 (100)	52/52 (100)	52/52 (100)	156/156 (100)	41/41 (100)	197/197 (100)
4. What time of day is it? Is it morning, afternoon or night time?						
4 years	15/19 (79)	15/19 (79)	16/19 (84)	46/57 (81)	11/14 (79)	57/71 (80)

5 years	9/13 (69)	9/13 (69)	9/13 (69)	27/39 (69)	6/10 (60)	33/49 (67)
6 years	8/10 (80)	8/10 (80)	9/10 (90)	25/30 (83)	8/8 (100)	33/38 (87)
7 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	9/9 (100)	39/39 (100)
Total	42/52 (81)	42/52 (81)	44/52 (85)	128/156 (82)	34/41 (83)	162/197 (82)
5. *What is the name of this place?*						
4 years	19/19 (100)	19/19 (100)	19/19 (100)	57/57 (100)	14/14 (100)	71/71 (100)
5 years	13/13 (100)	13/13 (100)	13/13 (100)	39/39 (100)	10/10 (100)	49/49 (100)
6 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	8/8 (100)	38/38 (100)
7 years	10/10 (100)	10/10 (100)	10/10 (100)	30/30 (100)	9/9 (100)	39/39 (100)
Total	52/52 (100)	52/52 (100)	52/52 (100)	156/156 (100)	41/41 (100)	197/197 (100)

C= correct responses; T= total responses

Table 2

Rate of correct responses to each memory item, stratified by age group and day of testing

Question	Day 1	Day 2	Day 3	Total (3 Days)	Day 4	Total (4 Days)
Age Group	C/T (%)	C/T (%)	C/T (%)	C/T (%)	C/T (%)	C/T (%)
6. Target face: *Which photo did you have to remember?*						
4 years	-	19/19 (100)	19/19 (100)	38/38 (100)	14/14 (100)	52/52 (100)
5 years	-	13/13 (100)	13/13 (100)	26/26 (100)	10/10 (100)	36/36 (100)
6 years	-	10/10 (100)	10/10 (100)	20/20 (100)	8/8 (100)	28/28 (100)
7 years	-	10/10 (100)	10/10 (100)	20/20 (100)	9/9 (100)	29/29 (100)
Total	-	52/52 (100)	52/52 (100)	104/104 (100)	41/41 (100)	145/145 (100)
7. Target name: *What was her name?*						
4 years	-	18/19 (95)	19/19 (100)	37/38 (97)	14/14 (100)	51/52 (98)
5 years	-	13/13 (100)	13/13 (100)	26/26 (100)	10/10 (100)	36/36 (100)
6 years	-	10/10 (100)	10/10 100)	20/20 (100)	8/8 (100)	28/28 (100)
7 years	-	10/10 (100)	10/10 (100)	20/20 (100)	9/9 (100)	29/29 (100)
Total	-	51/52 (98)	52/52 (100)	103/104 (99)	41/41 (100)	144/145 (99)
8-10. *Three target pictures.*						
4 years	-	16/19 (84)	8/19 (42)	24/38 (63)	4/14 (29)	28/52 (54)
5 years	-	13/13 (100)	9/13 (69)	22/26 (85)	1/10 (10)	23/36 (64)
6 years	-	10/10 (100)	8/10 (80)	18/20 (90)	4/8 (50)	22/28 (79)
7 years	-	10/10 (100)	8/10 (80)	18/20 (90)	2/9 (22)	20/29 (69)
Total	-	49/52 (94)	33/52 (63)	82/104 (79)	11/41 (27)	93/145 (64)

C= correct responses; T= total responses

Validation study two: children who had sustained TBI

The aim of the second study was to determine concurrent and predictive validity of the scale in the clinical population of children with traumatic brain injury aged 4 to 7 years (please see Lah, David, Epps, Tate, & Brookes, 2019). The scale was used to assess PTA with 35 children (26 boys) aged 4 years 0 months to 7 years 10 months (*M*= 5.8, *SD* = 1.2 years) successively admitted to Sydney Children's Hospital for TBI and referred to Brain Injury Rehabilitation between February 2008 to October 2012. Causes of TBI were: falls (*n*=12), bicycle/scooter/skateboard (*n*=10), motor vehicle accident pedestrian (MVA, *n*=6) and MVA passenger (*n*=5), sport (*n*=2).

Another indicator of injury severity included the Glasgow Coma Scale (GCS) score on hospital admission (or at the accident scene if the GCS on hospital admission was not available) that was documented in the medical record. According to the GCS, on average, children sustained a mild TBI (Median = 14/15; *IQR*= 10-15). Inspection of individual GCS scores showed that of the 35 children 25 sustained mild TBIs (GCS 13-15), 3 sustained moderate TBIs (GCS 9-12), and 7 sustained severe TBIs (GCS < 9).

Outcome was examined using King's Outcome Scale for Childhood Head Injury (KOSCHI; Crouchman, Rossiter, Colaco, & Forsyth, 2001) at discharge and two outpatient reviews conducted on average 6.3 (*IQR*= 4.9-8.0) and 19.9 (*IQR*= 13.5 – 25.8) weeks post hospital discharge. The KOSCHI includes the following outcomes: (1) death, (2) vegetative state, (3) severe disability (a or b), (4) moderate disability (a or b) and (5) good recovery. A subcategory b is indicative of better recovery relative to subcategory a across categories of outcomes (see Crouchman et al., 2001 for further details).

Concurrent validity. Longer PTA duration correlated with the lower GCS score (r = -.60, p < .001).

Predictive validity. Longer PTA duration correlated with the lower KOSCHI outcomes at each time point: discharge (r = -.47, p =.004), first review (r = -.70, p < .001), and second review (r = -.54, p < .002). Moreover, a series of ordinal linear regression (complementary log–log function) analyses showed that PTA duration was a significant predictor of KOSCHI outcomes at discharge, first and second review.

Overall, this second validation study showed that the SYPTAS had good concurrent validity, as it correlated with GCS. The SYPTAS was also found to have strong predictive validity, being a significant individual predictor of global outcomes at discharge and outpatient reviews.

Administration of the scale

Testing equipment

- A set of 3 photographs needs to be generated to use with the scale. The photos need to be of females (faces only) who are not involved in patient care. They can be printed in an A5 size. Number the back of each photo.
- Obtain the first name or a nick name of a main caregiver, without the child listening to the conversation (see item 2). Formulate two additional distractor names that may need to be used for recognition (i.e. if a child does not answer question 2 correctly). These distractor names need to start with the same letter and have the same number of syllables as the target name.
- Choose a target face and note the number on the protocol. Numbering will ensure that the correct target picture is reliably recorded across different raters.
- Select a target name to use with the photo in addition with two distractor names that have the same first letter and same number of syllables. Ensure that the target name is different from the carer name.
- Copy the SYPTAS protocol (page 29 of this manual).
- A pen.

Who should administer the scale?

The SYPTAS should be administered by clinical staff experienced with working with children with traumatic brain injury. Rapport needs to be established with the child so that they can adequately participate in the assessment process.

Testing environment

The SYPTAS should be administered at the child's bedside in a quiet room. Care should be taken to minimise noise, distractions, and interruptions during testing, as these may affect the child's ability to concentrate. The assessment process needs to be explained to the child. That is, let the child know that they are going to be asked some questions and shown a picture of someone that they need to remember.

Who is the SYPTAS suitable for?

The SYPTAS is designed to test PTA duration in children aged 4 years, 0 months – 7 years, 11 months who have suffered a TBI. The usefulness of the scale remains unknown for children who have major developmental disorders (e.g. intellectual disability, autism, cerebral palsy) or neurological illnesses (e.g. epilepsy, brain tumour). If the child does not speak fluent English, a translator should also be present.

When should administration of SYPTAS begin?

The SYPTAS should be administered once the child has regained consciousness (i.e., obtains GCS scores of 15/15) to a level at which they are able to provide intelligible verbal responses, or at the discretion of clinical staff.

When should administration of SYPTAS cease?

The SYPTAS administration should cease only after the child has satisfied the requirements for being out of PTA – i.e., after the child has obtained a perfect score of 5/5 on the SYPTAS on three consecutive days.

Standard Procedures

Administration of the scale usually takes approximately 5 minutes. The items should be administered in set order, as they appear on the SYPTAS protocol. On the first day of testing, all orientation and memory items are presented, but only the orientation items (1-3) are scored. Memory items (4-5) test the ability to form continuous memories and require the child to recall items that have previously been presented. Thus, while the memory items are presented on the first day of administration, they are tested and scored from the second day onwards.

Orientation (Items 1 to 3)

Item 1: "How old are you?"

- The child should first be given the opportunity to provide an answer.
- If the child does not provide an answer, a choice of 3 consecutive ages that includes the child's correct age should be offered:
  - ☐ E.g. "Are you 5, 6 or 7?" or "Are you 4, 5, or 6?"

Provide feedback.

"That's right", for the correct response.

"You are x years old." For the wrong response or no response.

Item 2: "What is your father's / mother's / another main caregiver (choose one of these) name?"

- The child should first be given the opportunity to freely provide an answer.
- If they fail to answer spontaneously, they should be given a choice of 3 names: the parent's name and two additional names that sound similar or start with the same letter.

☐ E.g. "Is it Sally, Sandra or Sarah?"

Provide feedback.

"That's right", for the correct response.

"Your father's / mother's / main caregiver's name is ……." For the wrong response or no response.

Item 3: "What is the name of this place?"

o The child should first be given the opportunity to freely provide an answer.

o If they fail to answer spontaneously, they should be given a choice of 3 places that includes the correct place:

☐ "Are you at home, in hospital or at school/pre-school/day-care?"

Provide feedback.

"That's right", for the correct response.

"You are in hospital." For the wrong response or no response."

Memory (Items 4 and 5)

Day 1

On the first day, the child should be shown one photo of a face and told the person's name.

Item 4

"Let me show you a photo of a person that I would like you to remember for me."

Make sure that the child is observing the photo while you are showing the photo.

Leave the photo in front of the child for 2-3 seconds before proceeding to Item 5.

Item 5

With the photo in front of a child say:

"This person has a name. Her name is [state name]"

Ask the child to repeat the name of a person after you.

Repeat the name of the person in the photo, if the child does not respond or if the child provides a wrong name.

Tell the child that you will ask them to remember the face and the name if the person:

"Remember her face and her name for me."

On each subsequent day, the child will be asked to choose the target face out of three photographs, and recall the person's name.

Day 2 and all subsequent days of testing

Item 4: "Which face did you have to remember?"

- The child must choose ONE face from the three photos of faces.
- There are no 'prompting' questions for this item

Provide feedback.

"That's right, this was the face I asked you to remember", if the child chooses the correct face. Remove the other two faces and leave the correct face in front of the child for a couple of seconds. Administer Item 5.

"This is the face I showed you yesterday." If the child chooses a wrong face or does not provide a response

Point to the correct face and remove the other 2 faces

Leave the correct face in front of the child for a couple of seconds. Administer Item 5

If the child points to more than one face, provide the following feedback:

"I showed you only one of these faces yesterday. Do you remember which one I showed you?"

Encourage the child to choose one face only.

If the child again points to more than one face, proceed as per instructions for wrong response.

- Point to the correct face and remove the other 2 faces
- Leave the correct face in front of the child for a couple of seconds.

If the child spontaneously changes their response, before receiving feedback, check with the child which face they are choosing. Proceed as per their choice. If their changed response is an incorrect one, proceed as per "child chooses a wrong face" specified above.

Item 5: "What is their name?"

- The child should first be given the opportunity to freely provide an answer.
- If the child fails to provide the answer or gives a wrong name, they should be given a choice of 3 names (including the target face's correct name) that sound similar or start with the same letter:

☐ "Is it Lisa, Lucy or Leanne?"

If the child picks the right name, provide the following feedback.

"That is right, her name is [provide name]."

Leave the card on the table and say: "When I come back tomorrow, I want you to remember this person and tell me her name."

If the child picks the wrong name or does not respond, after being encouraged, provide the following feedback:

"No, her name is [provide name]."

Ask the child to repeat the name after you.

Leave the card on the table and say: "When I come back tomorrow, I want you to remember this person and tell me her name."

Scoring

Each item is scored 0 (incorrect) or 1 (correct). A score of 1 is provided if the child either recalled or recognised the correct answer.

On the first day of testing, only the orientation items (1-3) should be scored. Memory items (4-5) are first scored on the second day of testing, as they require the child to recall items presented the day before. Each correctly answered item is scored one point. Therefore, the maximum score on day one is 3, and the maximum score on each day thereafter is 5.

Given that levels of consciousness often fluctuate when patients are emerging from PTA, obtaining a perfect score on one day may not be a reliable indication that the child is out of PTA. Therefore, the child must obtain a maximum score on all orientation and memory items on three consecutive days to be classified as out of PTA.

PTA duration is calculated from the day of injury to the first of three consecutive days that a maximum score of 5/5 was obtained.

Interpretation Guidelines

PTA duration, as measured by the SYPTAS, is currently the best-known early indicator of TBI severity in children aged 4-7 years. Below are the guidelines for interpreting PTA duration with regards to TBI severity (Khan, Baguley, & Cameron, 2003). Remember, PTA duration is calculated from the day of injury to the first of three consecutive days of perfect scores of 5/5 on the SYPTAS.

Table 3.

Classification of TBI severity (Khan et al., 2003)

Duration of PTA	Severity of Injury
<24 hours	Mild
1-7 days	Moderate
1-4 weeks	Severe
>4 weeks	Very Severe

TBI, traumatic brain injury; PTA, post-traumatic amnesia

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Patient Label

Sydney Post Traumatic Amnesia Scale (SYPTAS) Protocol

Lah, Parry, Epps & Brookes, 2019

Date of Onset of Testing: _____

Examiner: _____ Target face to be used: _____ Parent name to be used: _____

A=Answer S=Score (1 or 0)

ITEM:		DATE						
1. How old are you?	A							
	S							
2. What is your mother / father's name?	A							
	S							
3. What is the name of this place?	A							
	S							
4. Which photo did you have to remember?	A							
	S							
5. What is this person's name?	A							
	S							
TOTAL								

P.T.A. may be deemed to be over on the first of 3 consecutive days of a recall of 5/5